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Social Vulnerability in Hazard Mitigation Program

INTRODUCTION

An effective mitigation program consists of hazard area definition, hazards notification, restriction of public subsides, and hazard area acquisition (Godschalk, 2000). If implemented successfully, these procedures not only can reduce the property damages, but also save lots of human lives. However, after doing couple researches regarding on how sea level rise can impact the coastal hazard mitigation in New Jersey, one conclusion is that the hazard area definition has to be established in advanced before the subsequent procedures can be developed. In other words, only when the hazard area near the coast is defined before further mitigation procedures can be implemented. Therefore, the focus now has changed from developing a suitable coastal mitigation program to the establishment of the hazard area definition specifically for Cape May County.

BACKGROUND

When an area is being discussed, lots of contributing factors should be considered because it involves not only just one single object, but also a series of different species and ecosystems. According to Cutter, “the development of a set of indicators that measure vulnerability is the key to the improve resilience and sustainability of the state’s coastal communities” (Cutter, 2008). In other words, a state’s coastal communities consist of different types of factors and it has to be put into

consideration for hazard area definition. Hence, couple categories are being considered before an effective hazard area definition map can be established. They are the age of population, ability to speak English for all population, and the household income, which in term can be summed up as the social vulnerability. Each of them has their own variables which need to be considered.

OBJECTIVES

This project will focus on the human infrastructure because the social vulnerability is mainly associating with the social component of the society. The objective is to develop a vulnerability index map for Cape May County at the block group level, and then overlay the map with the sea level rise and storm surge scenario to compose a social vulnerability map. The result will produce a map that indicates how vulnerable the population is based on their social behavior. Hence, the resulting maps would help Cape May County to develop a suitable mitigation plan based on the social vulnerability.

METHODS

For the purpose of this project, only three categories are being considered as part of the social vulnerability; however, more categories could be considered depending on the level of detail that the government need. The data are downloaded from the census bureau at the block group level for Cape May County. For age of the population, those who are below 18 years old and above 65 years old are extracted out. It is then further categorized into six levels which are those under 3 years old, between

4 and 10 years old, between 11 and 17 years old, between 65 and 74 years old, between 75 and 84 years old, and lastly over 85 years old. In terms of the capability of speaking English, five levels are identified. First level includes those whose first language is English. The other four levels are identified as those whose first language is not English. They either speak English very well, or speak English well, or speak English not well, or not speak English at all. Last category is the household income where the household is divided into eight levels based on their average income value. The weight is then being summed up after each level of the category is assigned a weight between 0 and 10. From these weighted value, a vulnerability map can be composed for each category. The last step is to overlay the vulnerability map with the sea level rise scenario to display how vulnerable each block group is.

RESULTS

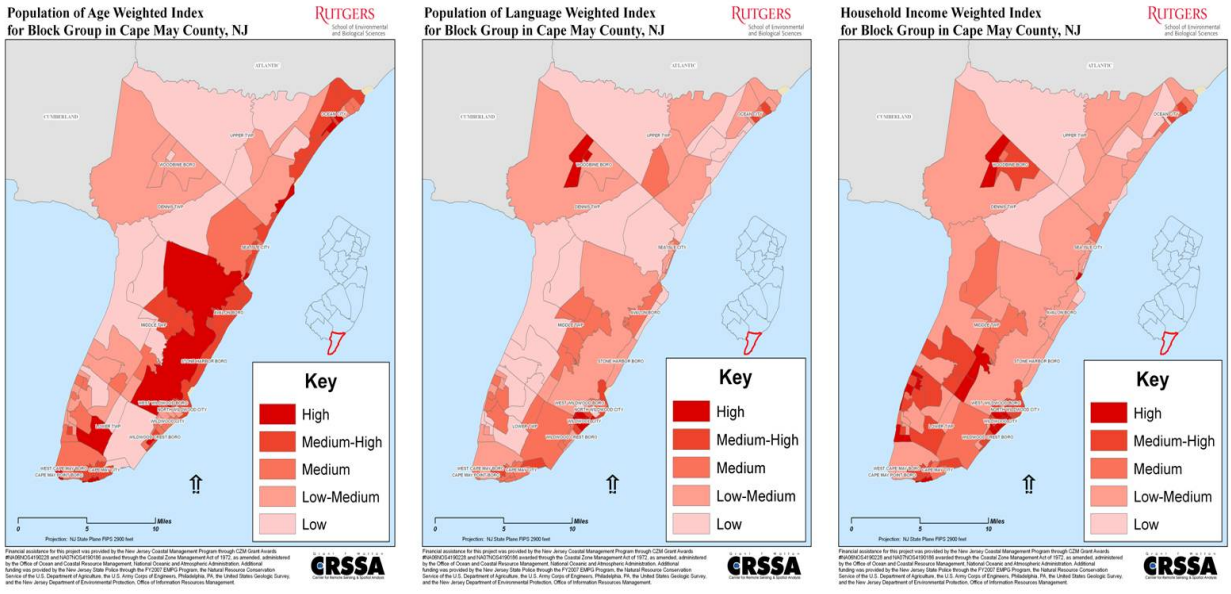

Figure 1: Vulnerability map for age of population, ability to speak English, and household income (Produced by Shue, 2009).

Figure 1 is the resulting map for each category. The vulnerability index range from most vulnerable (high) to least vulnerable (low). Although the vulnerability of all the block groups under each category is different, some will be more vulnerable in one category compare to the other. In other words, the uncertainty is that depending on what the government wants to choose for categorizing the vulnerability map, it might affect the outcome of the map. Therefore, further works need to be done based on what the government thinks it is important in terms of the social component. Figure 2 is the final vulnerability map where the vulnerability of all block groups is overlay with the SLR scenario. Since this scenario is 30 year storm surge plus low eng SLR from the SWH level, the vulnerability index will change if it were overlay with another scenario. Therefore, the local government might develop a different mitigation plan based on what scenario that they are expecting.

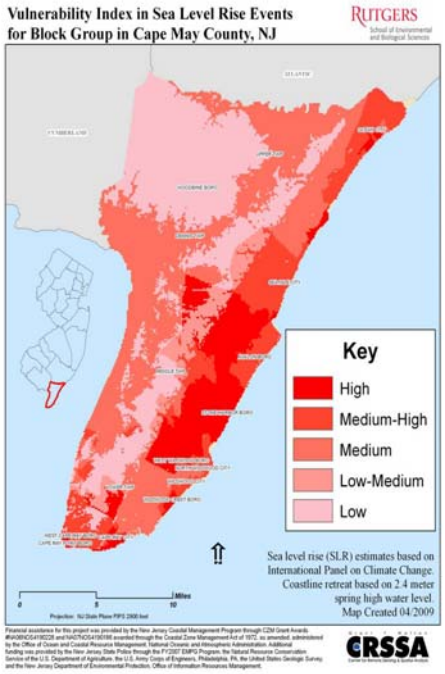

Figure 2: Vulnerability map when overlay with SLR scenario (Produced by Shue, 2009)

CONCLUSION

The resulting map will help the Cape May County to develop a specific mitigation plan for the coastal area. Depending on the level of detail that they need, they will be able to produce a different vulnerability map that is suitable for every part of the Cape

May County. Due to the fact that the data are not the final figures, thus, more information are needed and more analysis needs to be performed before a more accurate hazard area map can be produced. Therefore, this report is only part of an ongoing process and it needs the cooperation from the locals to the government level.

REFERENCE

Godschalk, D. R.; Norton, R; Richardson, C; Salvesen, D. 2000. Avoiding Coastal Hazard Areas: Best State Mitigation Practices. Environmental Geosciences 7(1):13-22

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